

**ABSTRACT**

The invention relates to an affinity sensor for detecting specific molecular binding events, for use in the field of molecular biology, e.g., in medical diagnostics, especially in biosensor technology or in DNA microarray tests. The aim of the invention is to provide an affinity sensor of this type for rapidity, sensitively, specifically, economically and routinely detecting the presence of molecules, especially bioactive molecules, and to provide special applications for an affinity sensor of this type. To this end, the affinity sensor consists of a support substrate which is provided with at least two electrodes.

The electrodes are situated equidistantly from each other and cover an area on both sides, at least this area being provided for receiving immobilised specific binding partners which are capable of coupling complementary corresponding binding partners directly or with other specific binding molecules. The area is established with a minimum width  $b$ , in such a way that at least one

complementary corresponding binding partner which is provided with an electroconductive particle can be received in the area in such a way as to guarantee the possibility of a tunnel-type contact junction forming between the particle and the electrodes in each case. The affinity sensor is used for biomonitoring.